

WHAT IS CLAIMED IS:

1. A fiber optic sensing system comprising:
  - (a) an optical module comprising a light source and a photodetector;
  - 5 (b) a probe comprising a glass optical fiber core, the probe configured to be coupled to a transducer;
  - (c) an extension comprising a plastic optical fiber core;
  - (d) a first connector configured to optically couple the extension to the probe;
  - 10 (e) a second connector configured to optically couple the extension to the optical module; and,
  - (f) a signal processor configured to process signals from the photodetector,wherein light emitted from the light source is transmitted to the  
15 probe and returned to the photodetector by the extension.
2. The fiber optic sensing system of claim 1 wherein the light source is incoherent.
- 20 3. The fiber optic sensing system of claim 1 wherein the plastic optical fiber core has a diameter greater than 0.25 millimetres.
4. The fiber optic sensing system of claim 1 wherein the plastic optical fiber core is constructed from polymethyl methacrylate.
- 25 5. The fiber optic sensing system of claim 1 wherein the glass optical fiber core has a diameter greater than 0.25 millimetres.
6. The fiber optic sensing system of claim 1 wherein the light source  
30 emits blue light and the probe is coupled to a transducer

comprising a temperature sensitive phosphor configured to emit red light when excited by blue light.

- 5 7. The fiber optic sensing system of claim 1 wherein the light source emits broadband light and the probe is coupled to a transducer comprising a cavity with a pressure sensitive membrane.
- 10 8. The fiber optic sensing system of claim 1 wherein the probe is coupled to a transducer comprising a coating configured to react to specific chemical substances.
- 15 9. The fiber optic sensing system of claim 1 wherein the extension comprises a first plastic optical fiber core and a second optical fiber core, and wherein the second connector is configured to optically couple the first plastic optical fiber core to the light source and the second plastic optical fiber core to the photodetector.